CLAIMS

1. Process for treatment of a feedstock that comprises hydrocarbons with at least four carbon atoms per molecule, whereby said feedstock comprises diene compounds and primarily butadiene as well as acetylene compounds in a minor proportion, whereby said process comprises a distillation stage of the feedstock introduced in a distillation zone that comprises a rectification zone and a drainage zone and at least one stage for hydrogenation of acetylene compounds in at least one hydrogenation zone with at least one catalytic bed under suitable hydrogenation conditions in the presence of a gas that contains hydrogen, whereby the process is characterized in that a portion of the feedstock that circulates in the distillation zone that is enriched with acetylene compounds is drawn off laterally in liquid phase at a suitable draw-off level in the distillation zone and preferably in the drainage zone; the hydrogenation stage is carried out in the hydrogenation zone that is outside the distillation zone; a hydrogenation effluent that is low in acetylene compounds and enriched in oligomers is produced; and said hydrogenation effluent is recycled in the rectification zone, whereby the process is also characterized in that a C4 fraction that comprises essentially all of the butadiene and that is low in acetylene compounds is recovered at the top of the distillation zone, and an oligomer-enriched C5 fraction is recovered at the bottom of the distillation zone.

2. Process according to claim 1, wherein the feedstock is a steam-cracking effluent that contains for the most part hydrocarbons with four to five carbon atoms per molecule and preferably a majority of hydrocarbons with four carbon atoms.

3. Process according to one of claims 1 and 2, wherein the butadiene content in the feedstock is at least equal to 20% by weight and preferably equal to 50% by weight.

4. Process according to one of claims 1 to 3, wherein the feedstock contains at most 20% by weight of acetylene compounds, advantageously at most 5% and preferably at most 2.5%.

5. Process according to one of claims 1 to 4, wherein the draw-off flow rate is at most equal to twice the one of the feedstock, advantageously at most equal to one and one-half times the flow rate of the feedstock and preferably approximately equal to the one of the feedstock that is introduced in the distillation zone.

6. Process according to one of claims 1 to 5, wherein the feedstock is introduced at a level that essentially corresponds to the center of the distillation column; the lateral draw-off level is located below said center of the column at a height that corresponds to fewer than five theoretical plates; and the hydrogenation effluent is recycled above the center of the column at a level that corresponds to at most the height of the first five theoretical plates.

7. Process according to one of claims 1 to 6, wherein the ratio of the acetylene compounds/butadienes concentrations

at the level of the lateral draw-off is essentially the highest.

8. Process according to one of claims 1 to 7, wherein the operating conditions of the distillation zone are as follows:

Number of theoretical plates: 40, preferably 35-45

Absolute pressure: 4-10 bar, preferably 5 bar

Top temperature: 45°C, preferably 30°C to 50°C

Bottom temperature: 95°C, preferably 90°C to 150°C

9. Process according to one of claims 1 to 8, wherein the operating conditions in the hydrogenation zone are as follows:

Absolute pressure: 2 to 70 bar, preferably 5 to 15 bar

Temperature: 30 to 60°C, preferably 35°C to 45°C

Volumetric flow rate 3 to 10 h^{-1}, preferably 4 to 8 h^{-1}

Ratio of H_2/acetylene compounds (mol/mol) = 0.5 to 3, preferably 1.0 to 1.1

Noble metal catalyst of group VIII, preferably palladium; 0.01 to 1% by weight stabilized by at least one metal of the group formed by Au, Ag, Sn.

10. Process according to one of claims 1 to 4, wherein the temperature of the hydrogenation effluent is controlled upstream from the recycling level in the rectification zone of the distillation column.